

REMARKS/ARGUMENTS

Claims 1-16, and 19-21 have been cancelled. Claim 37 has been amended. Claims 38-39 have been added. Claims 17, 18, and 22-39 are pending.

Claim rejections under 35 USC § 102

The Examiner rejected claims 17-18, 20-22, 29-31, and 36 under 35 U.S.C. 102(e) as being anticipated by Hu (US Patent 6,316,354). The Examiner stated that col. 4, lines 17-25 and Fig. 2 show that the portion of the layer removed during the etching is larger than the portion of the hardmask layer 20 removed during etching to teach selective etching. Col. 4, lines 17-25, of Hu discloses that a via 40 has been previously etched down before the NH₃ plasma is provided, as shown in FIG.1. Therefore, Hu does not teach generating an NH₃ and then selectively etch the low-k dielectric layer with respect to the hardmask, as recited in claims 17 and 31.

The Examiner stated that col. 4, lines 45-52, and fig. 2 of Hu teaches simultaneously stripping the photoresist layer during selective etching of the low k dielectric layer. The Examiner stated that Hu discloses the same method using the same structure and material (low-k dielectric, hardmask, NH₃ gas) as the claimed invention and that under the principle of inherency, Hu plasma from NH₃ would have inherently been capable to selectively etch the organic low-k dielectric layer with respect to the hardmask.

Hu does not provide the same method and structure. Col. 4, lines 17 to 26, of Hu states that "a via 40 has been previously etched down through capping layers 10 and 20 and layer 14 of low k silicon oxide dielectric material to the top of metal line 6." Col. 4, lines 27 to 33, of Hu discusses the need for the NH₃ strip to remove the resist mask 30 without damaging the low k silicon oxide dielectric material in the sidewalls of the via 40. Since the vias have already been etched in Hu and the stripping process does not damage the sidewalls of the vias in Hu, Hu provides a different structure and does not etch the low k dielectric layer with NH₃ plasma as recited in claims 17 and 31. For at least these reasons, claims 17 and 31 are not anticipated by Hu.

Claims 18, 20-22, 29-30, and 36 are ultimately dependent on the independent claims. In addition, these claims add additional features, which when taken together with the limitations of

the independent claims are not anticipated or made obvious by the cited references. For at least these reasons, claims 18, 20-22, 29-30, and 36 are not anticipated or made obvious by Hu.

The Examiner rejected claim 37 under 35 U.S.C. 102(e) as being anticipated by Hu (US Patent 6,316,354). The Examiner stated that col. 4, lines 45-52, and fig. 2 of Hu teaches simultaneously stripping the photoresist layer during selective etching of the low k dielectric layer. The Examiner stated that Hu discloses the same method using the same structure and material (low-k dielectric, hardmask, NH₃ gas) as the claimed invention and that under the principle of inherency, Hu plasma from NH₃ would have inherently been capable to selectively etch the organic low-k dielectric layer with respect to the hardmask.

As discussed above, since Hu completely etches the vias before the NH₃ strip (different method and structure), the low k dielectric layer is not etched during the NH₃ strip.

In addition, claim 37 has been amended to specifically recite etching features into the organic dielectric layer using the plasma from the NH₃. As mentioned above, Hu etches the features before the NH₃ plasma is provided, therefore, the NH₃ is not used to etch features into the plasma. For at least these reasons, claim 37 is not anticipated or made obvious by Hu.

The Examiner objected to claims 23-28 and 32-35 as being dependent upon rejected base claims, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claim. The applicant's attorney appreciates the Examiner's comments. These claims will be amended as requested if required at a later time.

New claims 38 and 39 are dependent on claims 17 and 31, respectively and further recite that the selective etching by the NH₃ etches features into the organic low-k dielectric layer. This is not anticipated or made obvious by the cited references.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a

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telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (650) 961-8300.

Respectfully submitted,
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